APPENDIX A

Appendix A

EFFLUENT SAMPLING/BIOMONITORING ASSESSMENT PLAN

Pursuant to the Clean Water Act Section 308 Request for Information, dated March 22, 2012, Peabody Midwest Mining, LLC ("Peabody") has developed this Effluent Sampling/Biomonitoring Assessment Plan (the "Plan") for further monitoring, assessments and other studies in waters in and around the Bear Run Mine, including portions of the Busseron Creek, Black Creek, Indian Creek, and Maria Creek watersheds. As set forth herein, Peabody is proposing to conduct comprehensive effluent sampling of wastewater discharges from the Bear Run Mine, including sampling and analysis of chemical constituents far beyond the indicator effluent limits included in Peabody's NPDES permit and otherwise intended and promulgated under 40 CFR Part 434 and Indiana's Coal Mining NPDES permit requirements. Peabody is also proposing to complete additional biological assessment work to supplement the 14 fish, 53 macroinvertebrates, and 2,344 stream physical habitat evaluations already conducted at Bear Run.

1. Effluent Sampling

Sample Locations

Peabody's Bear Run Mine proposes to sample a total of five outfalls reporting to the four watersheds (Black Creek, Busseron Creek, Indian Creek, and Maria Creek) that receive discharge from Bear Run Mine. Representative outfalls were selected based on two criteria: (1) the outfalls receiving watershed and (2) the type of mining related source water (drainage or pumpage) received, as established by the EPA 308 Information Request priority system. Mine drainage status (alkaline or undetermined) was not incorporated into the outfall criteria based on preliminary sampling results that indicate all previously undetermined outfalls are alkaline (a Notice of Intent has been submitted to IDEM to that effect for the remaining unclassified outfalls). The mining related source water priority designations are as follows:

- Coal Refuse: areas where fine coal refuse is exposed to stormwater. Coarse coal refuse is returned to near the bottom of the active pit and covered by spoil. Fine coal refuse is sent to a slurry basin.

- Coal Storage: areas near the preparation plant that include raw coal storage, product coal, and coarse and fine refuse handling facilities.

- Active Mining: areas where topsoil, subsoil, and overburden have been removed. These include locations where soil stockpiles have been or are being established, and where soil stockpiles and overburden is exposed to stormwater events.

- Reclamation: areas where spoil, subsoil, and topsoil have been replaced and vegetation has been established.

The selection process includes at least one representative outfall for each of the four watersheds receiving drainage from the Bear Run Mine affected area. Only one active outfall is present in the Black Creek, Indian Creek, and Maria Creek Watersheds, 062, 053, and 058 respectively. Two outfalls were selected

for the Busseron Creek Watershed, outfall 03R reports to Buttermilk Creek and 044 reports to Middle Fork Creek. None of the active outfalls at the Bear Run Mine receive source water from coal refuse (Priority 1). Outfalls 044 and 062 receive source water from coal storage and coal preparation plant areas (Priority 2); Outfalls 053 and 058 receive surface water drainage from active mine areas (Priority 3); and Outfall 03R receives surface water drainage from reclamation areas (Priority 4). Sample locations are shown on revised Map 4E1. The watershed, receiving stream, and source water/priority classification for each outfall is found in Table 1.

Watershed/ Receiving Stream	Permit #	Priority 1. Coal refuse pile	Priority 2. Coal preparation plant & associated areas (includes refuse disposal areas.)	Priority 3. Controlled surface mine drainage areas	Priority 4. Reclamation areas
Busseron Creek / Buttermilk Creek	S-256	**NA**			**03R**
Busseron Creek / Middle Fork Creek	S-256-1	**NA**	**044**		
Black Creek / Spencer Creek	S-256-2	**NA**	**062**		
Indian Creek / Pollard Ditch	S-256-4	**NA**		**053**	
Maria Creek / Unnamed Tributary	S-256-4	**NA**		**058**	

Table 1. Sample Locations Based on EPA Priority System

Sample Requirements

Effluent samples will be collected from each of the above listed outfalls twice a month for a total of four months. Sample collection will be dependent on the discharge condition, with one sample collected under base flow conditions and the other sample collected under precipitation conditions. Effluent samples will be analyzed for the following analytes which are those required on the Federal NPDES Part 5-C of Form 2C, 1M-13M metals (1.) plus general water quality indicator parameters (2.).

1. Metals: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.

2. Additional sampling parameters: acidity, alkalinity, chloride, hardness, pH, sulfate, total suspended solids, and total dissolved solids.

Selected analytes include total metals and additional analytes that will reflect any and all changes in water chemistry associated with mining activities. Discussions with the Illinois EPA indicate that EPA Region 5 is satisfied with NPDES related water sampling and analyses at Illinois coal mines and it should be noted that the proposed list of constituents includes those required by Illinois EPA for predischarge background water quality, as required by special condition of the Illinois NPDES permit. Mercury analysis will follow EPA sampling Method 1669 and analytical Method 1631 SE. Samples will be collected by experienced personnel using standard industry practices. All samples will be collected using grab sample techniques, as agreed upon in technical discussions with EPA. Sampling procedures will include facing upstream (i.e. standing downstream) during sample collection and dipping the sample bottle into the stream without touching the stream bottom. Samples will be collected into polyethelyne containers,preservatives will be added when required, and the samples will be placed in a cooler for transportation to the lab as required. Samples will be delivered to McCoy & McCoy (McCoy & McCoy) Laboratories, Inc. located in Madisonville, Kentucky. McCoy & McCoy is a National Environmental Laboratory Program (NELAP) accredited laboratory and certifies that all applicable test results meet the requirements of NELAP. Other accredited laboratories may be used as necessary.

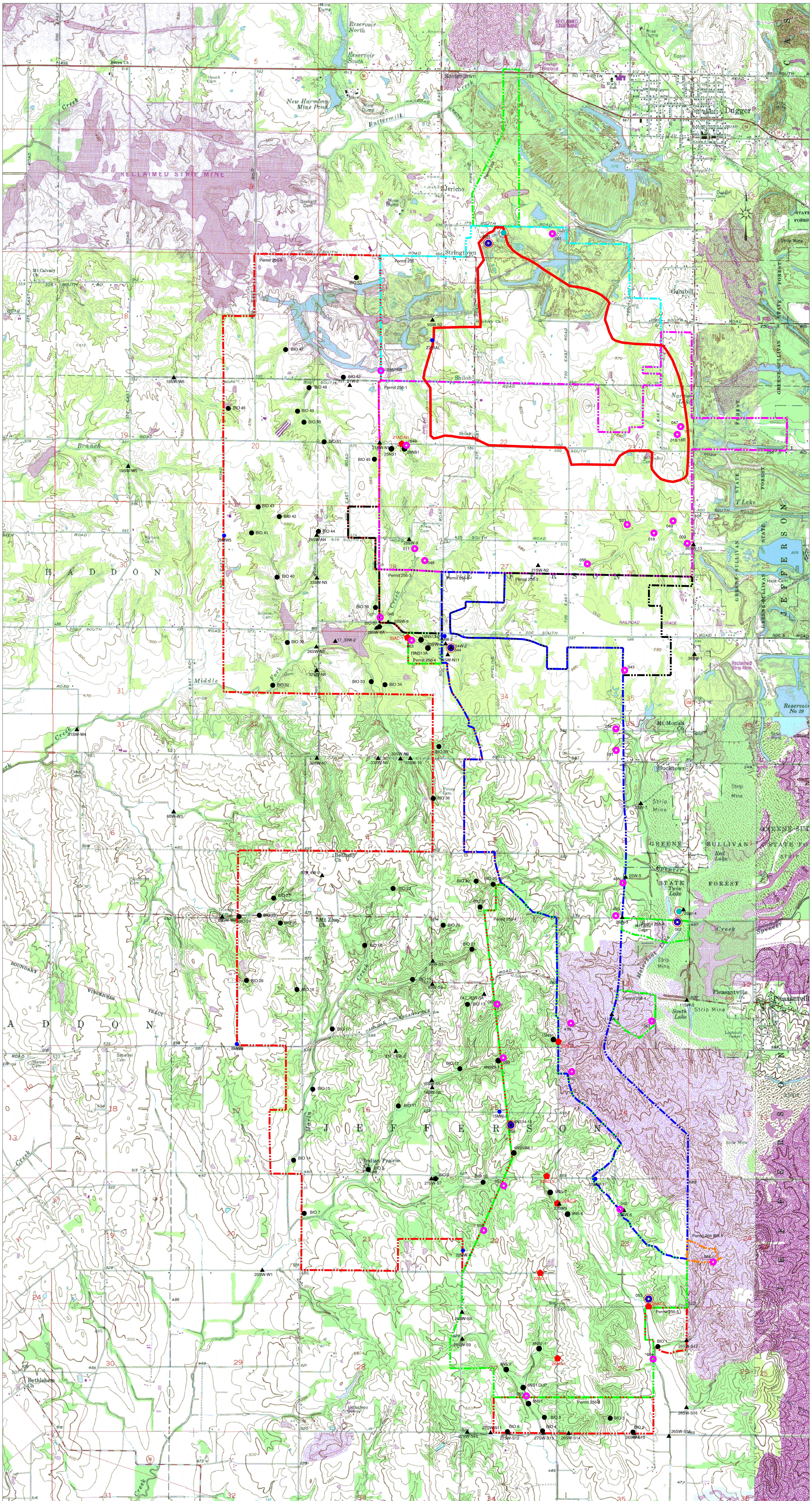
Quality Assurance/Quality Control Measures

QA/QC samples will be collected in accordance with IDEM protocols, as described in IDEM's Field Surveys Section Field Procedure Manual (2002). Specifically, a field duplicate will be collected at a rate of one duplicate for every 10 samples. A field blank will be collected as one blank for every 20 samples collected, or at a minimum one blank for every sampling event. Field documentation will include sample collection records, quality control records, and general field procedures. Laboratory documentation will include chain-of-custody forms, sample shipment information and management records, test methods, and laboratory data sheets.

2. Biological Assessment

Biological monitoring and sampling will be conducted downstream of outfalls 03R and 062 (Map 4E1). One sample will be collected at each location during the period of effluent sampling. Biological evaluation methods will include macroinvertebrate and fish sampling as well as stream physical habitat evaluation. Macroinvertebrate monitoring will follow the modified EPA Benthic Macroinvertebrate Protocol designed by IDEM and detailed in Multi-Habitat Macroinvertebrate Collection Procedure. Fish sampling will follow the EPA fish sampling protocol modified by IDEM in Summary of Protocols: Probability Based Site Assessment. Stream physical habitat evaluation will follow the EPA RBP II physical habitat evaluation method outlined by the EPA. Aquatic assemblages will be analyzed using the IDEM Biological Studies Section mIBI and fIBI scores. Bench notes and photographic evidence for each sample location will be submitted with the report.

APPENDIX A – EXHIBIT 1



LEGEND

- PERMIT S-00256
- PERMIT S-00256-1
- PERMIT S-00256-2
- PERMIT S-00256-3
- PERMIT S-00256-4
- PENDING PERMIT S-00256-5
- PERMIT S-00256-IBR 8
- PERMIT S-00264
- 26AC-1 USACE WATER CHEMISTRY STREAM SAMPLING LOCATIONS
- APPROXIMATE BEAR RUN RECLAIMED AREA
- 053 PROPOSED EFFLUENT SAMPLING LOCATIONS
- BIO 4 PROPOSED BIOLOGICAL AND WATER CHEMISTRY SAMPLING LOCATIONS
- 054 NPDES OUTFALL SAMPLING LOCATIONS
- 20SW-W1 SMCRA RELATED RECEIVING STREAM SAMPLING LOCATIONS
- 15MW-3 SMCRA RELATED GROUNDWATER SAMPLING LOCATIONS
- BIO 4 USACE BIOLOGICAL AND WATER CHEMISTRY SAMPLING LOCATIONS

Peabody ENERGY

PEABODY MIDWEST MINING, LLC
Evansville, Indiana

PERMIT NO.:	S-00256 AND OTHERS	MINE NAME:	BEAR RUN MINE
SCALE:	1" = 1,500'	QUADRANGLE:	BUCKTOWN, DUGGER, and LINTON, IN 7.5 MIN QUAD
DRAWN BY:	AMN	DESCRIPTION:	TOPOGRAPHY REPRESENTED BY 1980 PHOTO REVISED USGS QUADRANGLES & MAY NOT REPRESENT FIELD CONDITIONS
DATE:	JANUARY 6, 2012 - REV. MAY 22, 2012		

BEAR RUN MINE
4E1 Site Location Map